Overview
Renewable Resources In the West

2005 Integrated Energy Policy Report
Workshop on Renewable Resources and Transmission
May 9, 2005
Ray Dracker
Center for Resource Solutions

Why Consider Resources Outside of California?

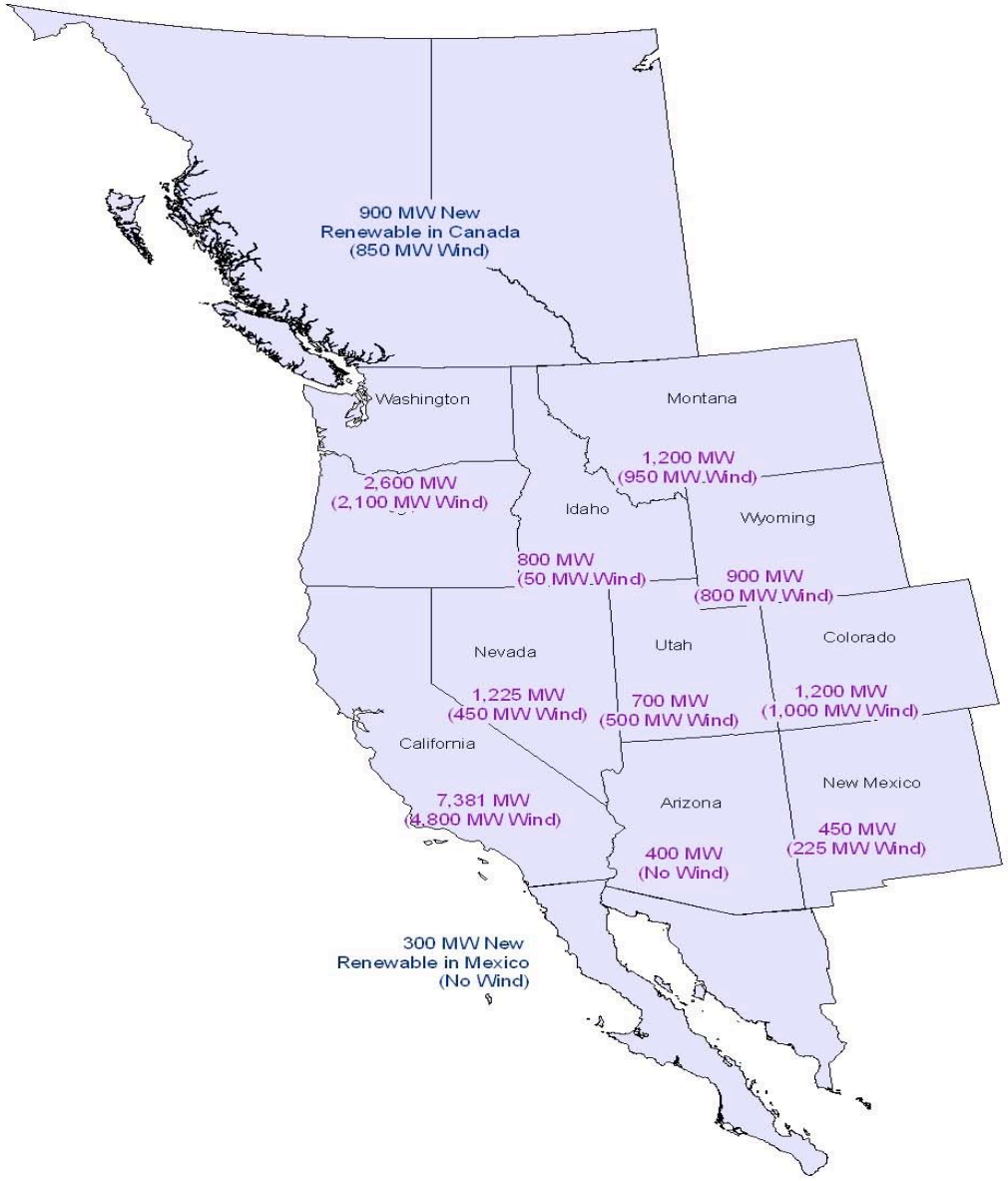
- There are large quantities of high quality renewable resource within California
- Sufficient to serve most of the near term RPS needs
- Transmission challenges motivate all new generation to be as close to load centers as practical
- Local economic development provides additional benefits to indigenous power production

Why Consider Resources Outside of California? But….

- An enhanced RPS would create need for approximately 10,000 MW of new renewable resources for California
- High/rising gas prices and State GHG goals may make renewable energy deployment attractive beyond even the enhanced RPS goals
- Availing itself of WECC-wide renewable resources creates greater supply-side options and opportunities for California
- Renewable energy geographical diversity may provide a more attractive production profile portfolio

Planned Renewable Resource Additions Throughout the West Through 2016

CEC estimate – April 2005



Wind Energy
Technical Potential

Nevada	18 GW
Oregon	23 GW
Washington	20 GW
New Mexico	18 GW
Colorado	196 GW
Wyoming	288 GW
Montana	332 GW

Source: Renewable Energy Atlas of the West

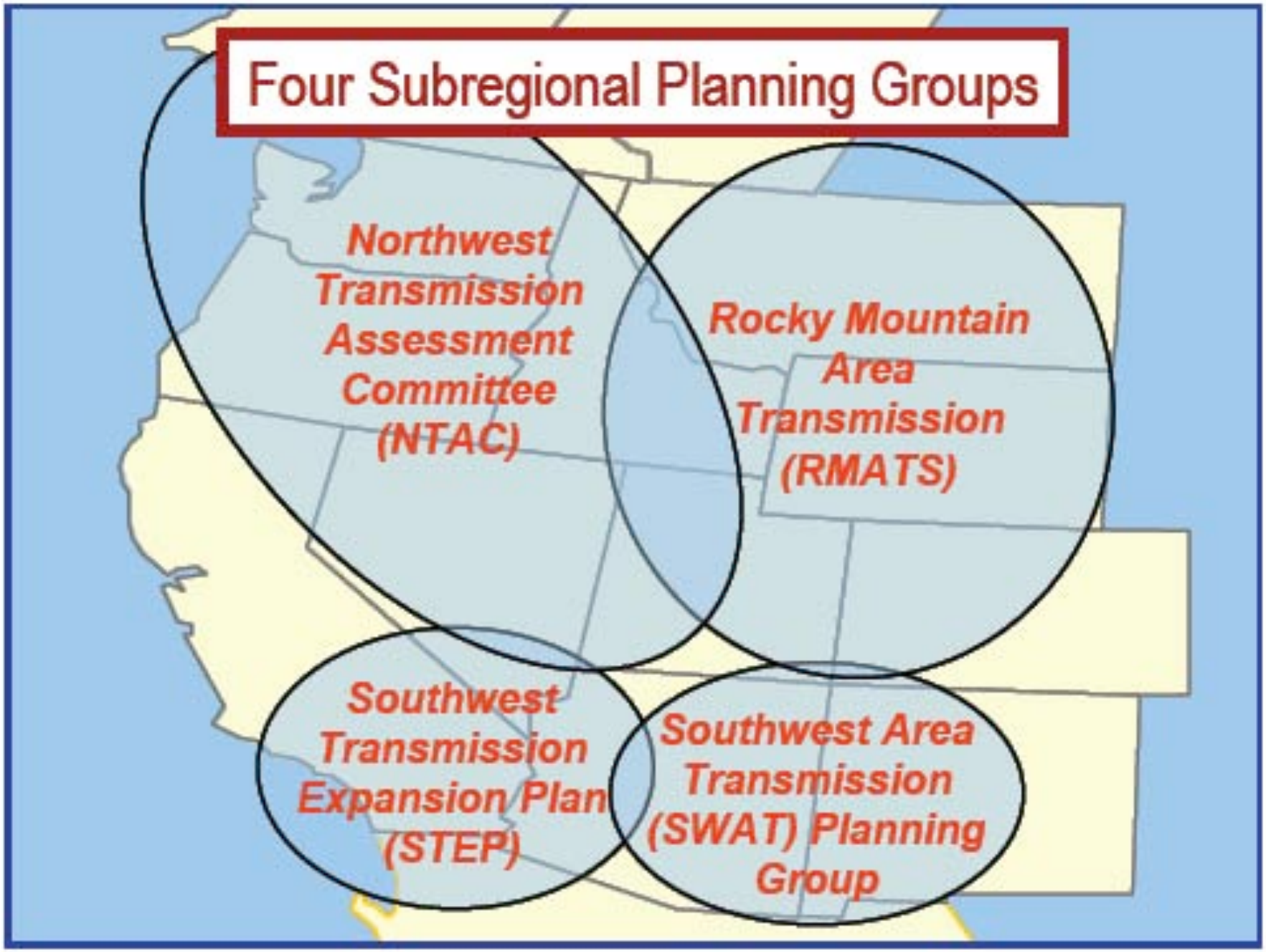
Geothermal Energy Technical Potential

Nevada	2.5 GW
Oregon	2.1 GW
Utah	1.1 GW

Source: Renewable Energy Atlas of the West

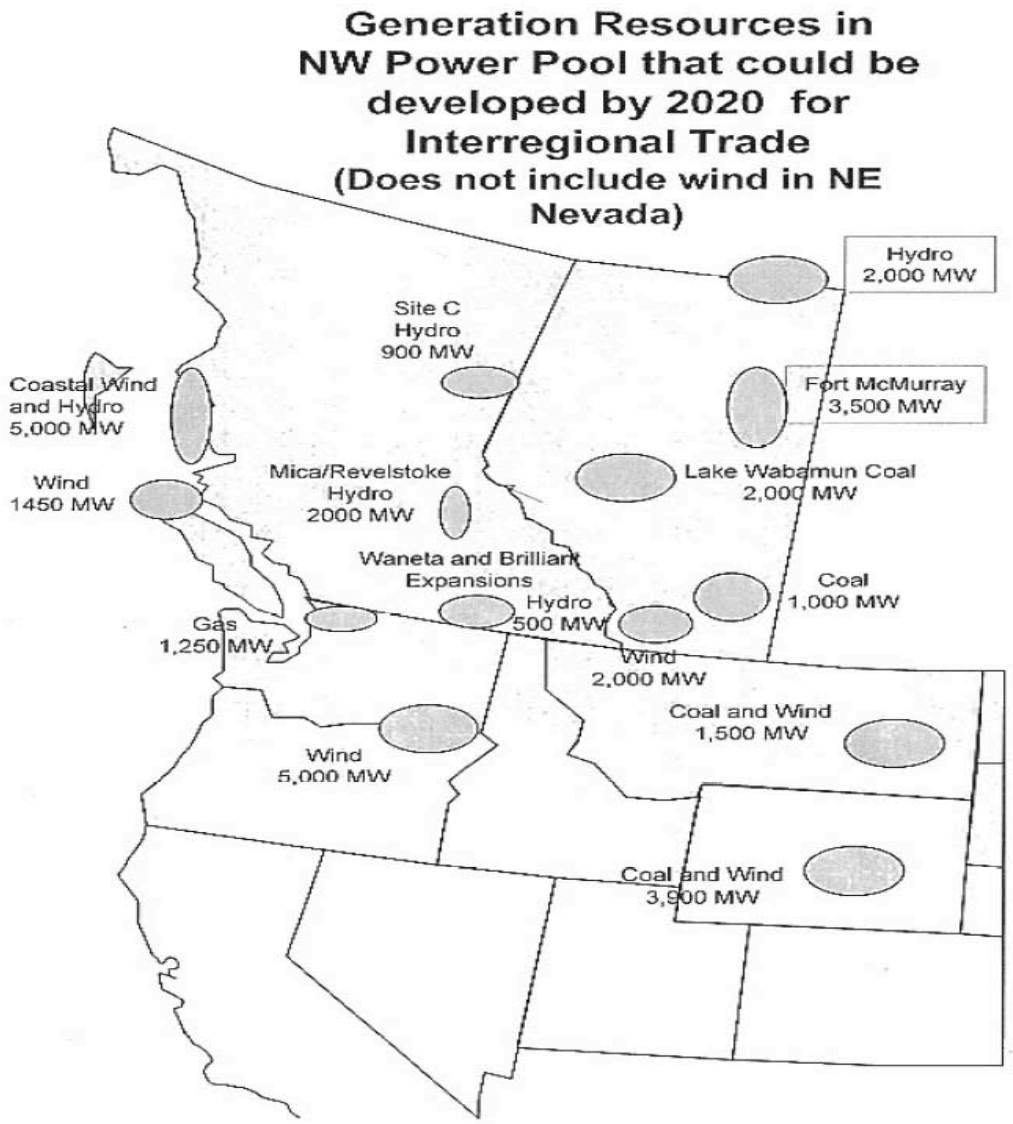
Subregional Resource-Transmission Planning Throughout WECC Evaluating RE Exports into CA

- Northwest Transmission Assessment Committee (NTAC)
- Rocky Mountain Area Transmission Study (RMATS)
- Southwest Transmission Expansion Plan (STEP)
- Southwest Area Transmission Study (SWAT)

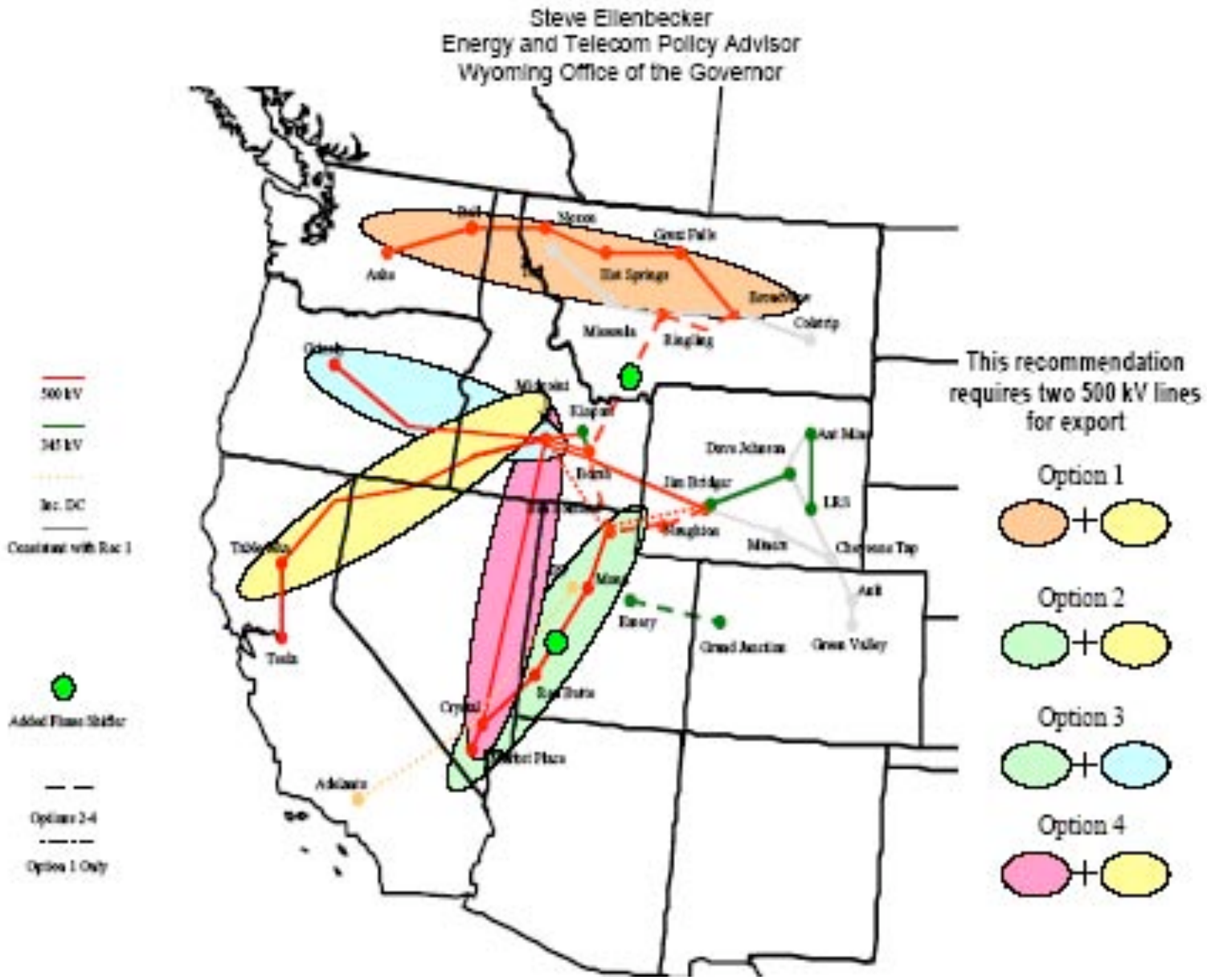

Four Subregional Planning Groups
Northwest Transmission Assessment Committee (NTAC)
Rocky Mountain Area Transmission (RMATS)
Southwest Transmission Expansion Plan (STEP)
Southwest Area Transmission (SWAT) Planning Group


Northwest
Transmission
Assessment
Committee

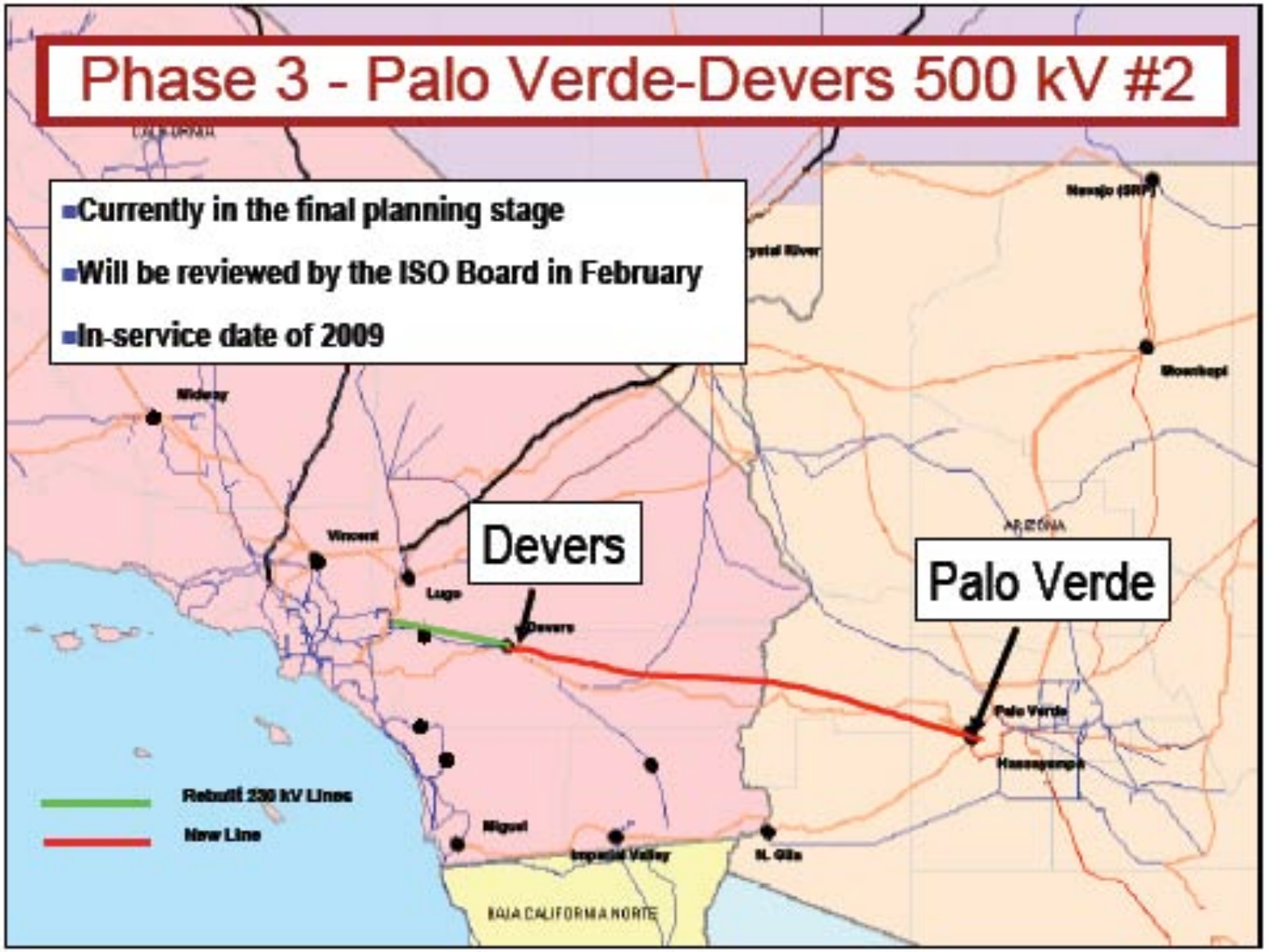
NTAC Outlook for New Power Generation



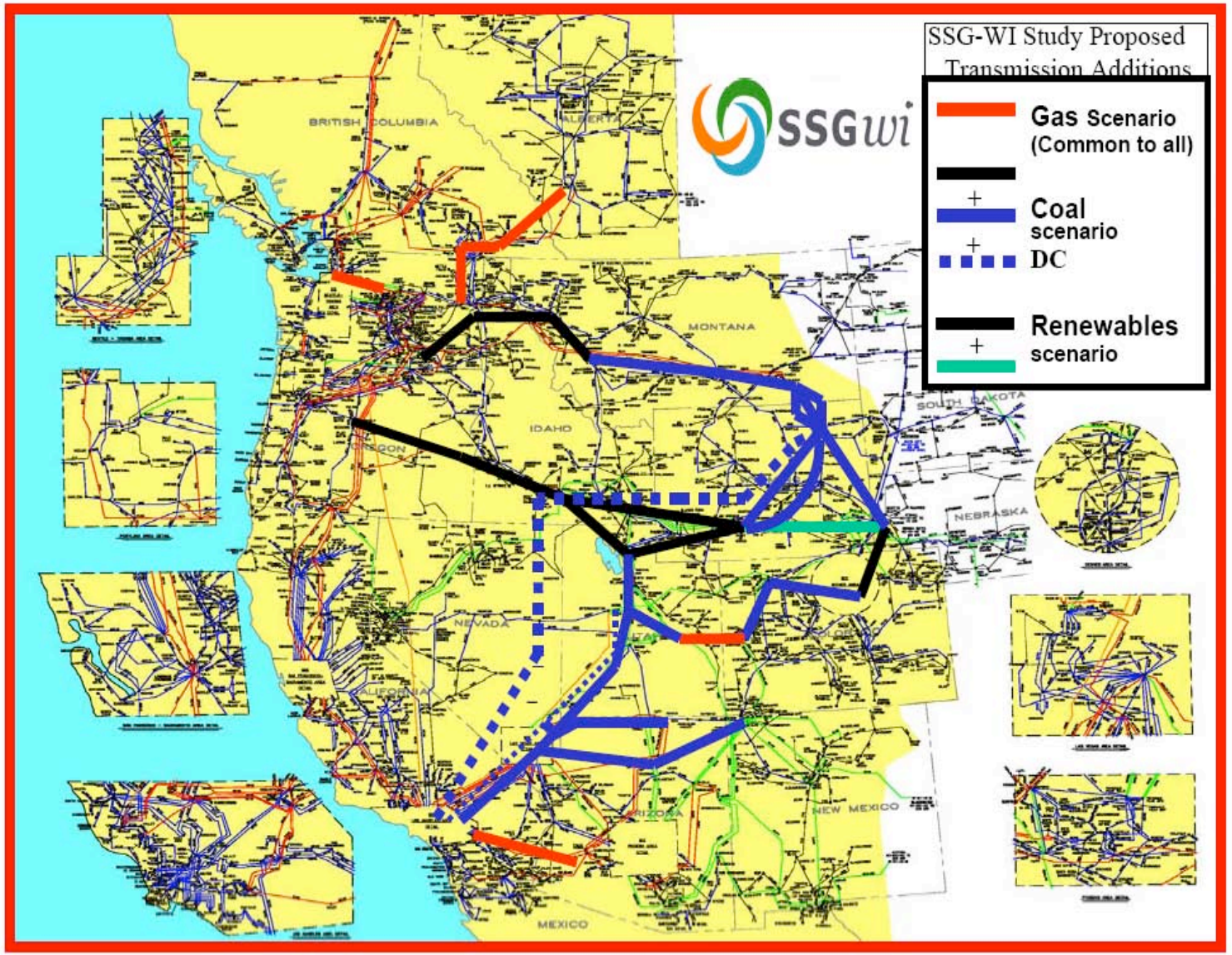
RMATS Long Term Plan - Preliminary



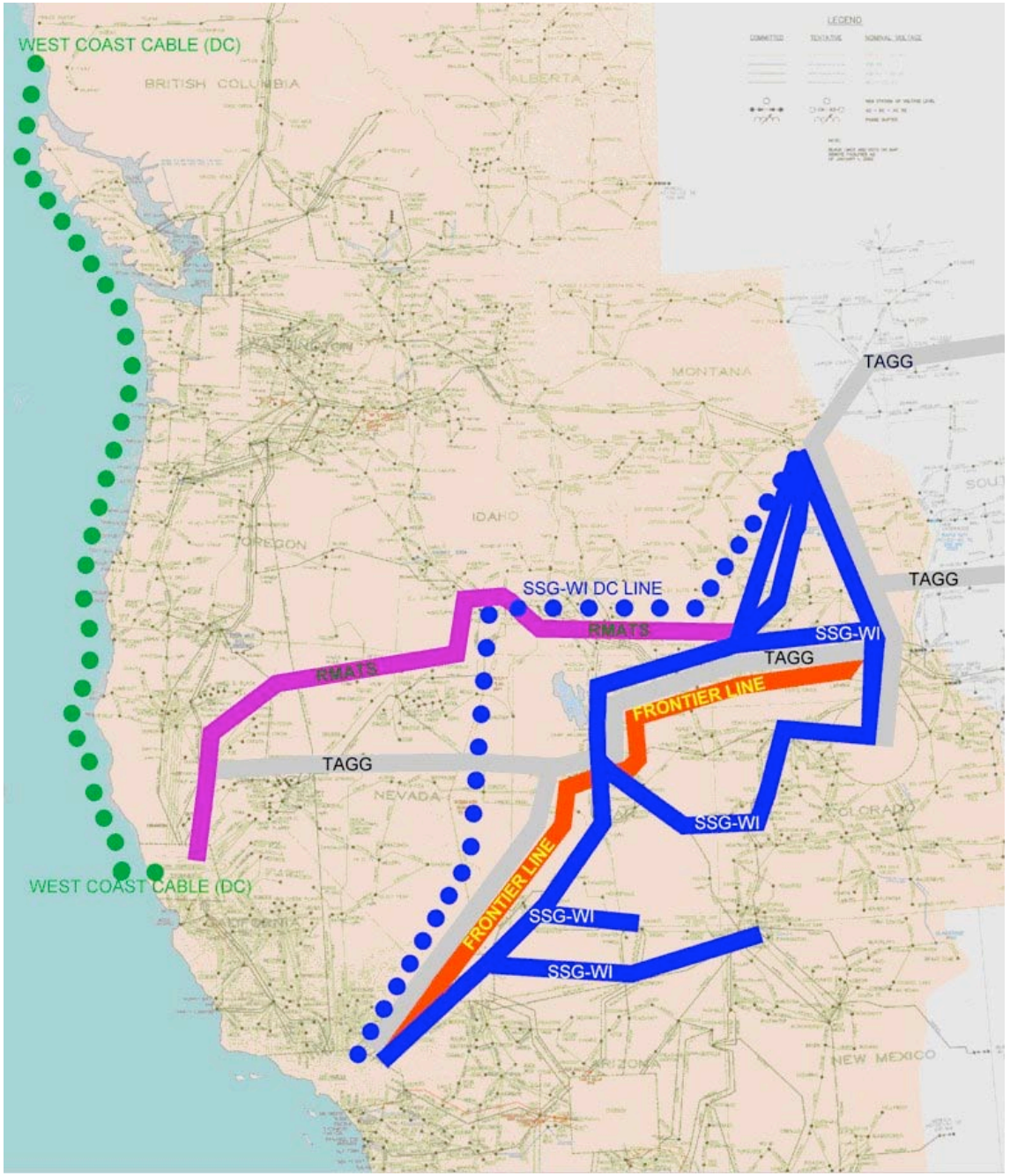
STEP Mid-Term Plan



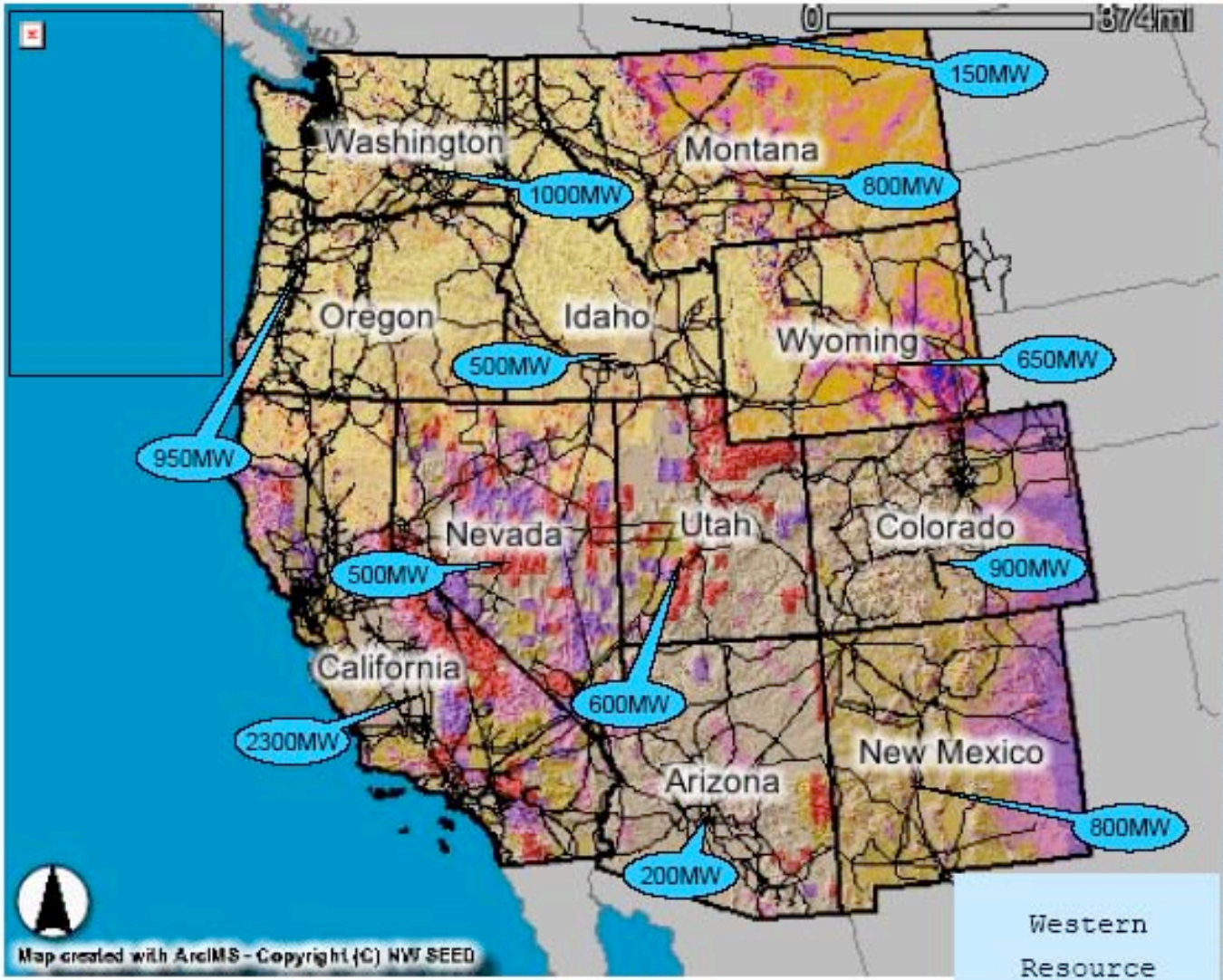
Background map courtesy of Western Electricity Coordinating Council



Other Concepts for Bringing New Generation and Transmission to California Markets

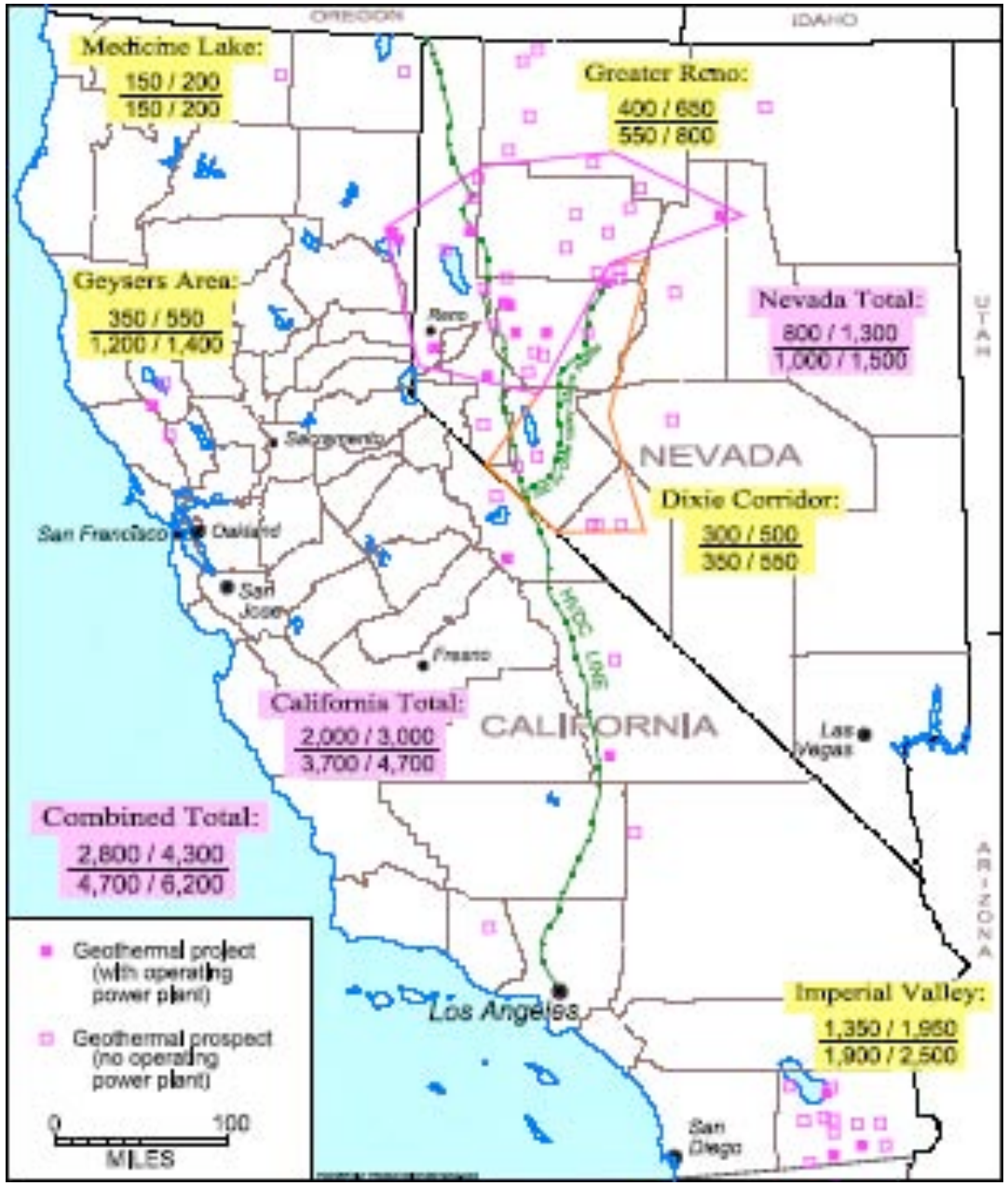


Wind



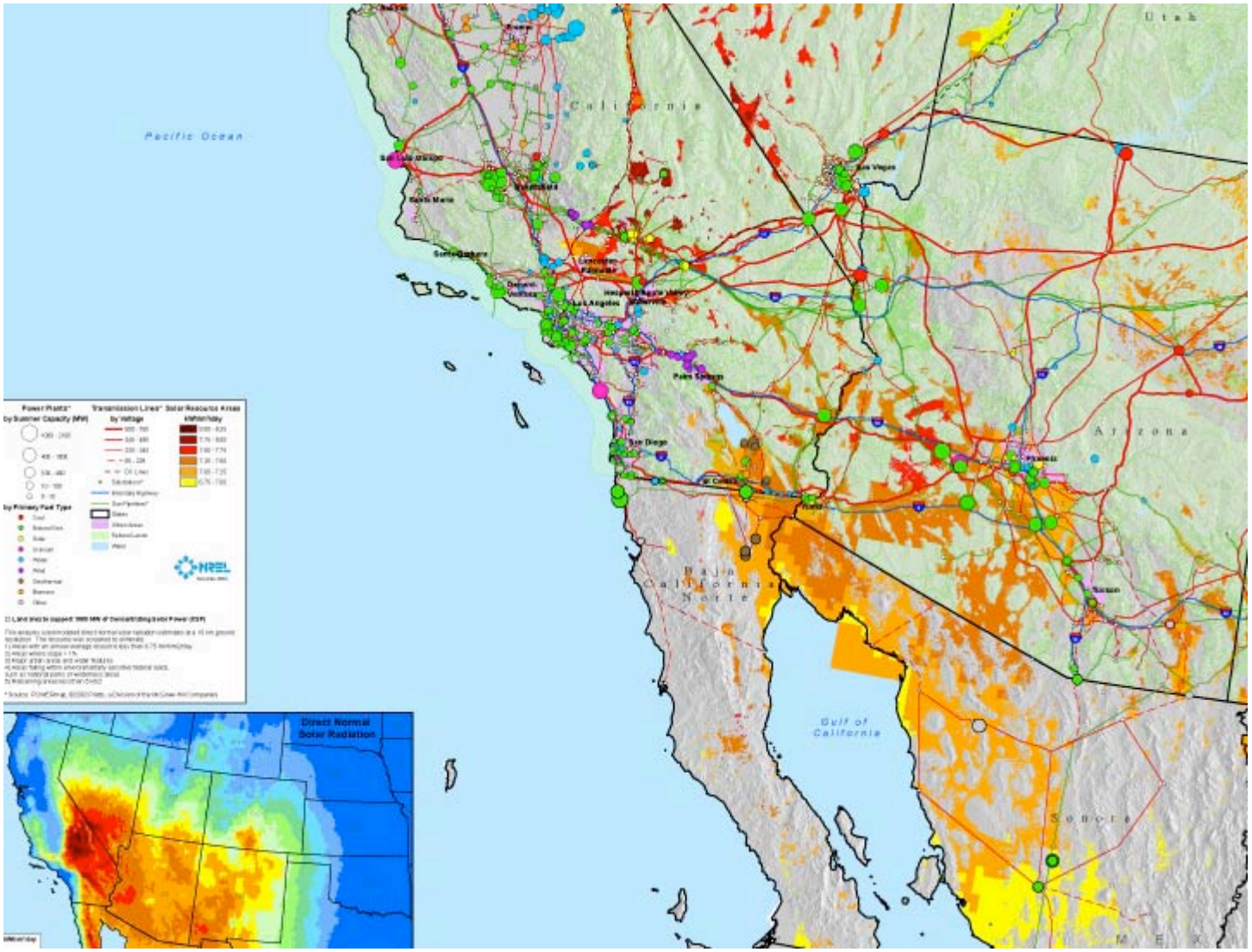
	SSG-WI Assumed Wi	
		2013 Ba
		(MW
AZ	E of Tuscon	100
AZ	Navajo	100
CA	Thch_Wd1	650
CA	SnGrgnWd	350
CA	AltmntWD	500
CA	SolanoWd	250
CA	Thch_Wd2	550
CO	CO (E) Ft Collins	400
CO	CO (E) Trinidad	400
CO	CO (W)	100
ID	Burley	200
ID	Mtn. Home	200
ID	Pocatella	100
MT	NW - Conrad/Shelb	400
MT	SC - Livingston	400
NV	N - Tonopah/Eureka	100
NV	S - NW of Vegas	400
NM	E- Tucumcari/Clovis	600
NM	4 Corners	200
NW	Columbia Gorge	650
NW	Bend	300
UT	Monticello	100
UT	St George	100
UT	NE Corner ???	400
NW	Columbia Gorge	200
NW	Ellensburg	500
NW	Spokane	300
WY	Casper/Rawlins	500
WY	Laramie	150
Canad	Alberta	150
		9350

Western Resource Advocates



Generation Capacities of Major Geothermal Resource Areas in California and Nevada (Gross MW)

Southwest Solar Resource



Representative Renewable Energy Resources in Select Western States

- Purpose: Identify a baseline set of resource areas that would serve as the basis for conducting a preliminary assessment of transmission (into California load centers) issues and opportunities
  - Select a representative set of resource areas to characterize issues and opportunities
  - This is not a comprehensive resource assessment or survey.
- Focus on States Adjacent to California
- Focus on Areas near existing Transmission Corridors
- Focus on Large Resource Opportunities (500 MW up)

Representative Renewable Energy Resource Areas

Additional Considerations

- A vast solar resource exists in western AZ and Southern NV (many time the quantities shown)
  - But there is a CSP resource of equal or superior quality in CA that is likely capable of serving all of the most optimistic bulk solar resource scenarios
- There is a large wind resource in northern New Mexico
- There is a vast wind resource (several thousand MW) in southern Wyoming and Montana
  - But transmission distances vast